

What is claimed:

1. A TDD type power amplification module comprising:

a terminal through which a TDD control signal is transmitted;

5 a first port through which a transmitting signal is inputted and a receiving signal is outputted;

a second port through which the transmitting signal is outputted and the receiving signal is inputted;

10 first and second transmission lines coupled between the first and second ports to have a quarter of a wavelength of the transmitting and receiving signals and to form a receiving signal path of the receiving signal;

a power amplifier unit amplifying the transmitting signal inputted through the first port to output the amplified transmitting signal to the second port;

15 first and second switching units provided between the first and second ports and the power amplifier unit, and forming and blocking a transmitting and receiving signal path between the first port and the second port through the power amplifier unit;

a third switching unit provided between a junction of the first and second transmission lines and ground to be alternatively turned on and off according to a TDD control signal so as to maintain or block a transmission of the receiving signal; and

20 third and fourth transmission lines coupled between the terminal and the first and second switching units to transmit the TDD control signal to the first and second switching units as a bias signal, and having a quarter of a wavelength of the transmitting and receiving signals.

25 2. The TDD type power amplification module of claim 1, wherein the power amplifier unit comprises:

a power amplifier coupled between the first and second switching units to amplify the

transmitting signal by a predetermined gain; and

first and second matching networks coupled between input and output terminals of the power amplifier and the first and second switching units to perform impedance matching.

5 3. The TDD type power amplification module of claim 1, wherein the power amplifier unit comprises:

one of a filter and a circuit removing a high frequency component of the transmitting signal outputted from the power amplifier unit.

10 4. The TDD type power amplification module of claim 1, wherein each of the first, second, and third switching units comprises:

a pin diode.

15 5. The TDD type power amplification module of claim 1, wherein the power amplifier unit is in one of an on-state and an off-state according to the TDD control signal.

6. The TDD type power amplification module of claim 2, wherein the second matching network comprises:

20 one of a filter and a circuit removing a high frequency component of the transmitting signal outputted from the power amplifier unit.

7. A class I bluetooth module comprising:

an antenna;

a class II bluetooth module comprising,

25 a bluetooth transceiver IC modulating and demodulating transmitting and receiving data using a TDD method of a bluetooth standard, and generating a TDD transmitting and receiving mode control signal, and

a TDD transmitting and receiving switch alternatively connecting the antenna to one of a transmitting terminal and a receiving terminal according to the TDD transmitting and receiving mode control signal of the bluetooth transceiver IC; and

a TDD type power amplification module provided between the class II bluetooth module and the antenna to be operative according to the TDD transmitting and receiving mode control signal of the bluetooth transceiver IC, amplifying the transmitting data to transmit the amplified transmitting data to the antenna, and transmitting the receiving data received from the antenna to the class II bluetooth module.

8. A bluetooth module comprising:

a bluetooth transceiver having a first terminal through which a transmitting signal and a receiving signal are transmitted, and generating a TDD transmitting and receiving mode control signal; and

a TDD power amplification module formed of an integrated circuit, having a second terminal receiving the TDD transmitting and receiving mode control signal, having a first port connected to the terminal of the bluetooth transceiver, having a second port, amplifying the transmitting signal received from the bluetooth transceiver through the first port to output the amplified transmitting signal through the second port according to the TDD transmitting and receiving mode control signal, and transmitting the receiving signal received through the second port without amplifying the receiving signal.

9. The bluetooth module of claim 8, wherein the TDD power amplification module comprises:

first and second transmission lines coupled between the first and second ports through first and second capacitors, respectively;

a first switch coupled between the second terminal and a first junction between the first capacitor and the first transmission line;

a second switch coupled between the second terminal and a second junction between the second capacitor and the second transmission line; and

a third switch coupled between a potential and a third junction between the first and second transmission line.

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10. The bluetooth module of claim 9, wherein the TDD power amplification module comprises:

a power amplifier amplifying the transmitting signal transmitted through the first switch to output the amplified transmitting signal to the second switch according to the TDD

10 transmitting and receiving mode control signal.

11. The bluetooth module of claim 10, wherein the TDD power amplification module comprises:

a third capacitor and a first matching network coupled between the power amplifier and the first switch.

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12. The bluetooth module of claim 10, wherein the TDD power amplification module comprises:

a fourth capacitor and a second matching network coupled between the power amplifier and the second switch.

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13. The bluetooth module of claim 10, wherein the TDD power amplification module comprises:

a third transmission line coupled between the second terminal and the first switch.

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14. The bluetooth module of claim 10, wherein the TDD power amplification module comprises:

a fourth transmission line coupled between the second terminal and the second switch.

15. The bluetooth module of claim 10, wherein the TDD power amplification module comprises:

5 a first path formed by the first port, the first switch, the power amplifier, the second switch, and the second port so as to transmit the transmitting signal through the power amplifier.

16. The bluetooth module of claim 15, wherein the TDD power amplification module comprises:

10 a second path formed by the second port, the second transmission line, the first transmission line, and the first port so as to transmit the receiving signal from the second port to the first port without passing through the power amplifier.

15 17. The bluetooth module of claim 11, wherein the first switch comprises:
a pin diode having an anode coupled to the second terminal and a cathode coupled to the first junction between the first port and the first transmission line.

18. The bluetooth module of claim 17, wherein the second switch comprises:
20 a second pin diode having an anode coupled to the second terminal and a cathode coupled to the second junction between the second port and the second transmission line.

19. The bluetooth module of claim 10, wherein the third switch comprises:
a pin diode having an anode coupled to a junction between the first and second
25 transmission lines and a cathode coupled to the ground.

20. A bluetooth module coupled to an external integrated circuit and an antenna,

comprising:

- 5 a TDD power amplification module formed of an integrated circuit, having a second terminal receiving a TDD transmitting and receiving mode control signal from the external integrated circuit, having a first port connectable to a terminal of the external integrated circuit, having a second port connectable to the antenna, amplifying a transmitting signal received from the external integrated circuit through a first port to output the amplified transmitting signal through the second port according to the TDD transmitting and receiving mode control signal, and transmitting the receiving signal received through the second port without amplifying the receiving signal.